HANGLEY ARONCHICK SEGAL & PUDLIN & SCHILLER

ATTORNEYS AT LAW / A PROFESSIONAL CORPORATION

One Logan Square
27th Floor
Philadelphia, PA 19103-6933
215.568.0300/facsimile
www.hangley.com

PHILADELPHIA, PA
CHERRY HILL, NJ
HARRISBURG, PA
NORRISTOWN, PA

Steven T. Miano
Direct Dial: 215-496-7025
E-mail: smiano@hangley.com

January 5, 2017

VIA EMAIL

Ms. Chloe H. Kolman
Environment & Natural Resources Division
Env. Defense Section
P.O. Box 7611
Washington, D.C. 20044

Nina Rivera, Esquire
Office of Regional Counsel
U.S. Environmental Protection Agency
1650 Arch Street; Region 3
Philadelphia, PA 19103

Corinne Bell, Esquire
Staff Attorney
Delaware Riverkeeper Network
925 Canal Street
7th Floor, Suite 3701
Bristol PA 19007

Re: **Status Report No. 6**

Dear Ms. Kolman, Ms. Rivera and Ms. Bell:

Pursuant to paragraph B.3 of the Interim Settlement Agreement between the West Goshen Sewer Authority ("the Authority"), the United States Environmental Protection Agency, and the Delaware Riverkeeper Network, the Authority provides the representatives of the parties with the attached semi-annual status report regarding the Authority's efforts to make interim reductions in its discharge of phosphorus to Goose Creek.

Please let me know if you have any questions.

Yours truly,

Steven T. Miano

STM/cas
Cc: Ross A. Unruh, Esquire

WEST GOSHEN SEWER AUTHORITY
CHESTER COUNTY, PENNSYLVANIA

Status Report No. 6
December 30, 2016

This is a status report on the efforts completed by the West Goshen Sewer Authority (Authority) from June 2016 through December 2016 to evaluate interim reduction in total phosphorus (TP) discharged to Goose Creek as part of the Interim Settlement Agreement (Agreement) with the Environmental Protection Agency (EPA) and the Delaware Riverkeeper Network (DRN).

I. Previous Efforts

An evaluation of the existing wastewater treatment plant (WWTP) was completed in the fall of 2015. This evaluation was used to further develop and define the Capital Improvement Plan (CIP) to assist in determining what improvements to infrastructure components the Authority believes will result in an effluent TP discharge level of 0.8 mg/L (monthly average) within the Agreement's five-year timeframe (by January 3, 2019).

Following completion of the evaluation, the Authority commissioned the construction of a comprehensive computer model to further review the effects of the chemical addition on the WWTP performance and its ability to meet lower TP limits while meeting current NPDES limits for other constituents (e.g., pH). This was undertaken to provide a comprehensive review of the chemical addition strategy, including various simulations to refine the strategy without physically adding chemicals given the demonstrated effect on the effluent pH. The comprehensive model was completed using BioWin© wastewater process simulation software from EnviroSim Associated Ltd. The comprehensive model simulated the effects of the additional chemical addition, the impact to effluent pH, and the impacts to other unit processes. It was also used as the basis for completing the TP Reduction Evaluation Report.

The TP Reduction Evaluation Report included evaluation and comparison of the following alternatives:

1. Enhanced Chemical Addition
2. Biological Phosphorus Removal
3. Combination of Biological Phosphorus Removal and Enhanced Chemical Addition
4. Side Stream Treatment
5. Ballasted Clarification System
6. Filtration

Additional efforts previously undertaken are described in previous status reports.

II. Work Completed the Past Six (6) Months

1. The WWTP's Staff and Engineer have visited the Berks Montgomery Municipal Authority's WWTP in Gilbertsville, PA to review treatment technologies, speak with operators on treatment technologies, and identify potential equipment and/or operations changes that could result in improved performance of the West Goshen WWTP. In particular, the visit focused on COMAG©, a ballasted clarification system.

2. The WWTP Staff continued to test, monitor, and record phosphorus levels at the WWTP and used additional sampling data to calibrate the process model. TP and alkalinity testing was completed at various locations throughout the WWTP in order to evaluate the effects of multiple chemical injection points for both TP reduction and pH control. These locations include the equalization basins, primary clarifiers, aeration tanks, final clarifiers, and polishing clarifiers.

3. The WWTP process model and evaluation of TP removal alternatives was completed in July 2016. Based on the results of the TP Reduction Evaluation Report, the Authority commissioned the design of the enhanced chemical addition project and pilot testing of the ballasted clarification system for further evaluation. The WWTP process model was used in preparation of the preliminary design for the enhanced chemical addition project.

4. Following completion of the TP Reduction Evaluation Report, the Authority commissioned the design of an enhanced chemical addition system and bench scale testing of a ballasted flocculation system. The Enhanced Chemical Addition System Project includes chemical addition by adding the poly aluminum chloride (PAC)/polymer blend to the second injection location between the Secondary and Polishing Clarifiers where initial results were successful. This Project also includes chemical addition for pH adjustment prior to disinfection and a control/automation system to control the chemical dosing for optimum performance (based on both flow and effluent TP). Multiple chemical injection points are being added to provide the best locations that have the least impact on total WWTP performance.

   The Authority submitted the Water Quality Management (WQM) Part II Permit Application to the Pennsylvania Department of Environmental Protection on October 27, 2016 for installation of the enhanced chemical addition system. The Authority also submitted a grant application to the Pennsylvania Commonwealth Financing Authority (CFA) for the Project on October 30, 2016. CFA is scheduled to meet before March 30, 2017 to act on the grant applications and make awards. Following the CFA meeting, the Authority is prepared to finalize the project design and advertise the project for public bidding. A copy of the WQM Part II Permit Application and CFA Grant Application are available upon request.

5. Jar testing of the COMAG© ballasted clarification system was completed by Evoqua Technologies in September 2016. The wastewater used in the jar testing was obtained from Final Clarifier No. 2 and included the following characteristics:

Table 1-1: Wastewater Characteristics

pH	5.94 - 7.13
TSS (mg/L)	7.14
TP (mg/L)	1.57
Turbidity (NTU)	2.67
Total Cu (ug/L)	21.5
Soluble Cu (ug/L)	20
Total Pb (ug/L)	3.5
Soluble Pb (ug/L)	1

The jar testing yielded the following results:

Table 1-2: Jar Testing Results

	JAR 7	JAR 8	JAR 9	JAR 10	JAR 11	Jar 12
West Goshen PACL Dose (mg/L as product rec'd)	10	25	40	60	80	100
Flocculent (mg/L)	1	1	1	1	1	1
Final pH	6.37	6.36	6.36	6.36	5.96	5.25
TSS (mg/L)	4.30	2.00	1.70	1.26	2.17	19.30
TSS, %R	40%	72%	76%	82%	70%	-170%
TP (mg/L)	0.787	0.313	0.127	0.047	0.042	0.094
TP, %R	50%	80%	92%	97%	97%	94%
Turbidity, NTU	0.95	0.45	0.36	0.13	0.39	0.48
Total Cu (ug/L)				33		
Total Cu, %R				-53%		
Soluble Cu (ug/L)				31		
Soluble Cu, %R				-55%		

As shown in Table 1-2, the TP reduction was successful; however, the pH remained low and metals appeared to increase as a result of the TP removal chemistry. Additional work will need to be completed during the pilot testing to prove the effectiveness of this system and determine proper chemical dosing concentrations. The pilot testing could not be completed following completion of the jar testing, as originally projected, due to weather conditions. As identified below, pilot testing is scheduled to be completed in April 2016.

III. Work Planned for the next Six (6) Months

The Authority plans to complete the following work over the next six (6) months:

1. Begin pilot testing of the COMAG© ballasted clarification system in April 2017. The pilot testing will focus on maximizing the reduction of TP while maintaining regulatory compliance with other effluent requirements (pH, copper, etc.). The pilot will also provide data to support the repeatability and sustainability of achieving TP effluent limits at and below 0.8 mg/L.

2. Begin final design of the Enhanced Chemical Addition Project in April 2017. The Project is expected to be advertised for public bidding in June 2017 and operational by December 2017.

IV. Conclusion

The Authority has completed preliminary design and submitted both the Water Quality Management Part II Permit Application and a CFA Grant Application for enhanced chemical addition systems it believes will achieve the TP effluent limit of 0.8 mg/L within the Agreement's five-year timeframe. Over the next six months, the Authority will continue its efforts, including completing the design of the Enhanced Chemical Addition Systems Project and advertising the Project for public bids.